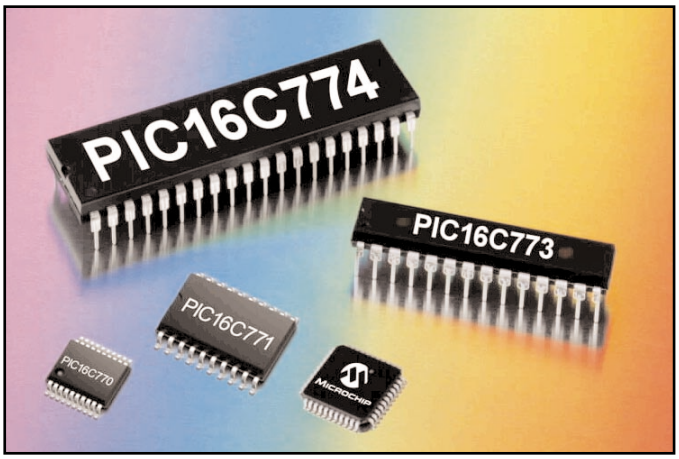
PIC16C77X Microcontroller Family

Product Information

The PIC16C77X microcontroller (MCU) family provides upward compatible devices from the PIC16C7XX devices in 20- to 44-pin packages with the highest level of analog peripheral integration in the industry. This family features a 14-bit instruction set, 6 to 10 channels, 12-bit Analog-to-Digital Converters, interrupt handling capability, various serial interface capabilities, Capture/Compare/PWM, programmable brown-out detection, programmable low voltage detection, absolute voltage reference generator and a deep 8-level stack. The PIC16C77X family provides performance and versatility to meet the most demanding requirements of today's cost sensitive analog designs. The PIC16C77X family is suited for applications ranging from security and remote sensors to appliance motor control and high speed automotive applications.



High Performance RISC CPU:

- Only 35 instructions to learn
- All instructions are single cycle (200 ns) except for program branches which are two-cycle
- Operating speed: DC - 20 MHz clock input
  DC - 200 ns instruction cycle
- 2048/4096 x 14 words of EPROM/OTP program memory
- 256 bytes of user RAM
- 14-bit wide instructions
- Interrupt capability
- 8-level deep hardware stack
- Direct, indirect and relative addressing modes
- 16 to 33 I/O pins
- 20, 28, 40 and 44-pin DIP, SOIC, SSOP, PLCC, TQFP and MQFP packages

Peripheral Features:

- Up to three timers:
  – Timer0: 8-bit timer/counter with 8-bit prescaler
  – Timer1: 16-bit timer/counter with prescaler, can be incremented during SLEEP via external crystal/clock
  – Timer2: 8-bit timer/counter with 8-bit period register, prescaler and postscaler
- Up to two Capture/Compare/PWM (CCP) modules
- Enhanced capture, compare, PWM module (PIC16C770/PIC16C771)
  – 1, 2 or 4 output PWM
  – Deadband control
  – Support for half- and full-bridge motor control
- 12-bit 6 to 10 channel Analog-to-Digital Converter
- Synchronous Serial Port (SSP) with SPI™ (Master mode) and I^2C™
- Universal Synchronous Asynchronous Receiver Transmitter (USART) with 9-bit address mode (PIC16C773/PIC16C774)
- Dual-speed oscillator with dynamic switching capability (PIC16C770/PIC16C771)

Peripheral Features (continued):

- Parallel Slave Port (PSP) 8-bits wide, with external $\overline{RD}$, $\overline{WR}$ and $\overline{CS}$ controls (PIC16C774)
- Programmable brown-out detection circuitry for Brown-out Reset (BOR)
- Programmable low voltage detection circuitry
- Absolute voltage reference generator

Special Microcontroller Features:

- In-Circuit Serial Programming™ (ICSP™) of program memory (via two pins) for EPROM/OTP
- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code protection
- Power saving SLEEP mode
- Selectable oscillator options:
  EXTRC: External low cost RC oscillator
  XT: Standard crystal/resonator
  HS: High speed crystal/resonator
  LP: Power saving, low frequency crystal
  ER: External resistor (PIC16C770/PIC16C771)
  INTRC: Internal resistor/capacitor (PIC16C770/PIC16C771)

CMOS Technology:

- Low power, high speed CMOS EPROM technology
- Fully static design
- Wide operating voltage range: 2.5V to 6.0V
- Commercial, Industrial and Extended temperature ranges
- Low power consumption:
  < 2 mA @ 5V, 4 MHz
  15 µA typical @ 3V, 32 kHz
  < 1 µA typical standby current

PIC16C77X Microcontroller Family *Continued*

Additional Information:

- Microchip's web site: ***www.microchip.com***
- Microchip's Technical Library CD-ROM, Order No. DS00161
- More than 112 Application Notes available:
  – *Embedded Control Handbook,* Order No. DS00092
  – *Embedded Control Handbook, Volume 2, Math Library,* Order No. DS00167
- Microchip's *Overview, Quality Systems and Customer Interface System,* Order No. DS00169
- Third party software and hardware support:
  – Emulators
  – Programmers
  – Gang Programmers
  – Software Tools
  – Development Boards and Accessories
  – Design Consultants
  – *Third Party Guide,* Order No. DS00104

PIC16C77X 8-bit Microcontroller Family

Product	Program Bytes	Memory Words	Memory Type	Data RAM Bytes	Max. Speed MHz	I/O Pins	ADC 12-Bits	Serial I/O	PWM	Brown-Out Detection	Timers	ICSP™	Other Features	Pins
PIC16C770	3584	2048x14	OTP	256	20	16	6	MI²C/SPI	1	Yes	1-16 bit, 2-8 bit, 1-WDT	Yes	4MHz internal oscillator, ECCP	20
PIC16C771	7168	4096x14	OTP	256	20	16	6	MI²C/SPI	1	Yes	1-16 bit, 2-8 bit, 1-WDT	Yes	4MHz internal oscillator, ECCP	20
PIC16C773	7168	4096x14	OTP	256	20	22	6	MUSART/ I²C/SPI	2	Yes	1-16 bit, 2-8 bit, 1-WDT	Yes	25mA source/sink per I/O, 2 Capture/Compare/PWM, Master I²C/SPI, 9-bit address, low-voltage detection, absolute voltage reference generator	28
PIC16C774	7168	4096x14	OTP	256	20	33	10	USART/ MI²C/SPI	2	Yes	1-16 bit, 2-8 bit, 1-WDT	Yes	25mA source/sink per I/O, 2 Capture/Compare/PWM, Master I²C/SPI, 9-bit address, low-voltage detection, absolute voltage reference generator	40, 44

Abbreviations: EECP = Enhanced Capture/Compare/PWM MI²C = Master I²C/SPI PWM = Pulse Width Modulator

Development Tools from Microchip		Resale Price*
MPLAB® IDE	Integrated Development Environment (IDE)	FREE
C compiler	Sold by third-party vendors (HI-TECH, IAR, CCS)	Contact Vendor
MPASM™ Assembler	Universal PICmicro macro-assembler	FREE
MPLINK™ Object Linker/ MPLIB™ Object Librarian	Linker/Librarian	FREE
MPLAB® SIM	Software Simulator	FREE
MPLAB® ICE 2000	Full featured modular in-circuit emulator	Starting at $2,045
PRO MATE® II	Full featured, modular device programmer	Starting at $854
PICSTART® Plus	Entry level program loader & dev. kit with PICC Lite™ Compiler	$199

*All prices are manufacturer's suggested resale for North America.

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